

**WHAT IS CLAIMED IS:**

1. An apparatus for processing multi-path signals in rake receiver having respective fingers are allocated with the multi-path signals received through different paths and demodulate the multi-path signals allocated to the respective fingers, the  
5 apparatus comprising:

the fingers, each receiving timing control signals generated from other fingers in order to track the allocated multi-path signals and tracking the multi-path signal allocated to the corresponding finger by selecting any one of the timing control signals of other fingers and an internal timing control signal in accordance with code tracker  
10 selection signals; and

a controller for receiving the timing control signals from the fingers, and outputting the code tracker selection signals corresponding to the respective fingers in accordance with differences among time delays being tracked by the fingers allocated  
15 with adjacent path signals.

2. The apparatus as claimed in claim 1, wherein the controller, if the time delay differences among the plurality of fingers confirmed by the timing control signals of the plurality of fingers allocated with the adjacent path signals approach a  
20 predetermined minimum reference time delay difference, outputs the code tracker selection signal for selecting the timing control signal from the first finger having the largest path power among the plurality of fingers to the second finger.

3. The apparatus as claimed in claim 2, wherein the controller, if the time delay difference between the first finger and the second finger confirmed by the internal  
25 timing control signal from the second finger that is selecting the timing control signal from another finger and the timing control signal from the first finger exceeds a predetermined maximum reference time delay difference, outputs the code tracker selection signal for instructing the second finger to select the internal timing control  
30 signal.

4. The apparatus as claimed in claim 2, wherein the controller, if the time

delay difference between the first finger and the second finger confirmed by the internal timing control signal from the second finger that is selecting the timing control signal from another finger and the timing control signal from the first finger is within a predetermined movable range, outputs the code tracker selection signal for instructing  
5 the second finger to select the internal timing control signal when an estimated tracking path of the second finger is in a direction where the time delay difference increases.

5. The apparatus as claimed in claim 4, wherein the controller, if the ratio of an early-hypothesis path power to a late-hypothesis path power on the basis of the time  
10 delay corresponding to the internal timing control signal from the second finger is larger than a predetermined reference power ratio, determines that the estimated tracking path of the second finger is in the direction where the time delay difference increases.

6. A method of processing multi-path signals in rake receiver having  
15 respective fingers are allocated with the multi-path signals received through different paths and demodulate the multi-path signals allocated to the respective fingers, the method comprising the steps of:

outputting code tracker selection signals corresponding to the respective fingers in accordance with differences among time delays being tracked by the fingers  
20 allocated with adjacent path signals with reference to timing control signals generated from the respective fingers in order to track the allocated multi-path signals;

the respective finger selecting any one of the timing control signals of other fingers and an internal timing control signal in accordance with the code tracker selection signals; and

25 tracking the path signal allocated to the corresponding finger using the selected timing control signal.

7. The method as claimed in claim 6, wherein if the time delay differences among the plurality of fingers confirmed by the timing control signals of the plurality of  
30 fingers allocated with the adjacent path signals approach a predetermined minimum reference time delay difference, the code tracker selection signal for selecting the timing control signal from the first finger having the largest path power among the plurality of

fingers is output to the second finger.

8. The method as claimed in claim 7, wherein if the time delay difference between the first finger and the second finger confirmed by the internal timing control  
5 signal from the second finger that is selecting the timing control signal from another finger and the timing control signal from the first finger exceeds a predetermined maximum reference time delay difference, the code tracker selection signal for instructing the second finger to select the internal timing control signal is output.

10 9. The method as claimed in claim 7, wherein if the time delay difference between the first finger and the second finger confirmed by the internal timing control signal from the second finger that is selecting the timing control signal from another  
finger and the timing control signal from the first finger is within a predetermined movable range, the code tracker selection signal for instructing the second finger to  
15 select the internal timing control signal when an estimated tracking path of the second finger is in a direction where the time delay difference increases is output.

10. The method as claimed in claim 9, wherein if the ratio of an early-hypothesis path power to a late-hypothesis path power on the basis of the time delay  
20 corresponding to the internal timing control signal from the second finger is larger than a predetermined reference power ratio, it is determined that the estimated tracking path of the second finger is in the direction where the time delay difference increases.

11. An apparatus for processing multi-path signals in rake receiver having  
25 respective fingers are allocated with the multi-path signals received through different paths and demodulate the multi-path signals allocated to the respective fingers, the apparatus comprising:

a code tracker for generating an internal timing control signal for obtaining an optimum sample position from the allocated path signals;

30 a timing control signal selector for receiving the internal timing control signal from the code tracker and the timing control signals from other fingers, and selecting and outputting any one of the internal timing control signal and the timing control

signals from other fingers in accordance with a time delay difference between the finger allocated with the path signal and the finger allocated with an adjacent path signal; and  
a demodulator for demodulating the allocated path signal in accordance with the selected timing control signal.

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12. The apparatus as claimed in claim 11, wherein if the time delay differences among the plurality of fingers confirmed by the timing control signals of the plurality of fingers allocated with the adjacent path signals approach a predetermined minimum reference time delay difference, the timing control signal from the first finger having the  
10 largest path power among the plurality of fingers is selected.

13. The apparatus as claimed in claim 12, wherein if the time delay difference between the first finger and the second finger confirmed by the internal timing control signal from the second finger that is selecting the timing control signal from another  
15 finger and the timing control signal from the first finger exceeds a predetermined maximum reference time delay difference, the second finger is made to select the internal timing control signal.

14. The apparatus as claimed in claim 12, wherein if the time delay difference  
20 between the first finger and the second finger confirmed by the internal timing control signal from the second finger that is selecting the timing control signal from another finger and the timing control signal from the first finger is within a predetermined movable range, the second finger is made to select the internal timing control signal when an estimated tracking path of the second finger is in a direction where the time  
25 delay difference increases.

15. The apparatus as claimed in claim 14, wherein if the ratio of an early-hypothesis path power to a late-hypothesis path power on the basis of the time delay corresponding to the internal timing control signal from the second finger is larger than  
30 a predetermined reference power ratio, it is determined that the estimated tracking path of the second finger is in the direction where the time delay difference increases.

16. A method of processing multi-path signals in rake receiver having respective fingers are allocated with the multi-path signals received through different paths and demodulate the multi-path signals allocated to the respective fingers, the method comprising the steps of:

5       generating an internal timing control signal for obtaining an optimum sample position from the allocated path signals;

          receiving the internal timing control signal and the timing control signals from other fingers, selecting and outputting any one of the internal timing control signal and the timing control signals from other fingers in accordance with a time delay difference  
10       between the finger allocated with the path signal and the finger allocated with an adjacent path signal; and

          demodulating the allocated path signal in accordance with the selected timing control signal.

15       17. The method as claimed in claim 16, wherein if the time delay differences among the plurality of fingers confirmed by the timing control signals of the plurality of fingers allocated with the adjacent path signals approach a predetermined minimum reference time delay difference, the timing control signal from the first finger having the largest path power among the plurality of fingers is selected.

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          18. The method as claimed in claim 17, wherein if the time delay difference between the first finger and the second finger confirmed by the internal timing control signal from the second finger that is selecting the timing control signal from another finger and the timing control signal from the first finger exceeds a predetermined  
25       maximum reference time delay difference, the second finger is made to select the internal timing control signal.

          19. The method as claimed in claim 17, wherein if the time delay difference between the first finger and the second finger confirmed by the internal timing control  
30       signal from the second finger that is selecting the timing control signal from another finger and the timing control signal from the first finger is within a predetermined movable range, the second finger is made to select the internal timing control signal

when an estimated tracking path of the second finger is in a direction where the time delay difference increases.

20. The method as claimed in claim 19, wherein if the ratio of an early-  
5 hypothesis path power to a late-hypothesis path power on the basis of the time delay corresponding to the internal timing control signal from the second finger is larger than a predetermined reference power ratio, it is determined that the estimated tracking path of the second finger is in the direction where the time delay difference increases.